



LTI-Limno-Tech, Inc.
Memorandum

DRAFT, Reference 6

US EPA RECORDS CENTER REGION 5



467779

TO: Jon F. DeWitt

DATE: September 2, 1988

FROM: Gregory Peterson

PROJECT: JD6-1

COPIES: Dave Hale, OBG
 Bill Creal, MDNR

RE: Bryant Pond Volume Estimates for Sediment with PCB
 Concentrations Exceeding 5, 10, 25, 50, and 100 mg/kg

This memorandum presents volume estimates for sediment in Bryant Pond with PCB concentrations exceeding specified criteria. The sediment volumes were estimated using Phase I, Phase II and preliminary Phase III analytical results from the 1988 Portage Creek Sediment Survey conducted cooperatively by the MDNR and Allied Paper, Inc. The volume estimates have been used to develop cost estimates for remedial action alternatives involving sediment excavation (ref: O'Brien and Gere Cost Estimates issued 7/30/88). Preliminary volume estimates were issued in a previous LTI memorandum (8/17/88) prior to receiving Phase III results. Changes in the volume estimates since 8/17/88 reflect the inclusion of Phase III results. For the earlier estimates, assumptions were made regarding the expected concentration for the Phase III samples. LTI has since received preliminary Phase III analytical results and these results are incorporated into the volume estimates presented herein.

The estimated volume of Bryant Pond sediment with PCB concentrations greater than 5, 10, 25, 50, and 100 mg/kg is graphically depicted in the attached Figure (Attachment 1) and listed below:

Criteria (mg/kg)	Sediment Volume (cubic yards)
5	73,568
10	64,357
25	52,563
50	46,625
100	38,859

The volumes were calculated using the PCB results for the 63 sampling stations in the 1988 survey. For the purposes of the calculations, the areas (polygons) represented by each station were determined by the Thiessen method in which polygons are described by perpendicular bisectors between adjacent stations. The areas and volumes represented by each station are listed in Attachment 2. Depths for each area represent the deepest sample for a given station which had PCB concentrations greater than or equal to the specified criteria. Volumes for each station were then simply calculated by multiplying the area and depth. The volume for each station was adjusted to account for the creek.

Volumes of the creek sections passing through each polygon were estimated from survey elevation data and were subtracted from the volumes for each station. The creek volume for each area is listed in Attachment 3. Attachment 3 also shows the total volume of soft sediment for each station. The soft sediment volumes were calculated using the depth to the end of each boring. These volumes are an approximation of the volume of material overlying the "natural soil".

Attachment 4 is a listing of the computer input deck used to calculate the sediment volumes for the different criteria.

ATTACHMENT 1 - Summary of Volumes Exceeding Various Criteria

Active Lists: None
Multi color Transects now in effect.
Color polygons

Concentrations

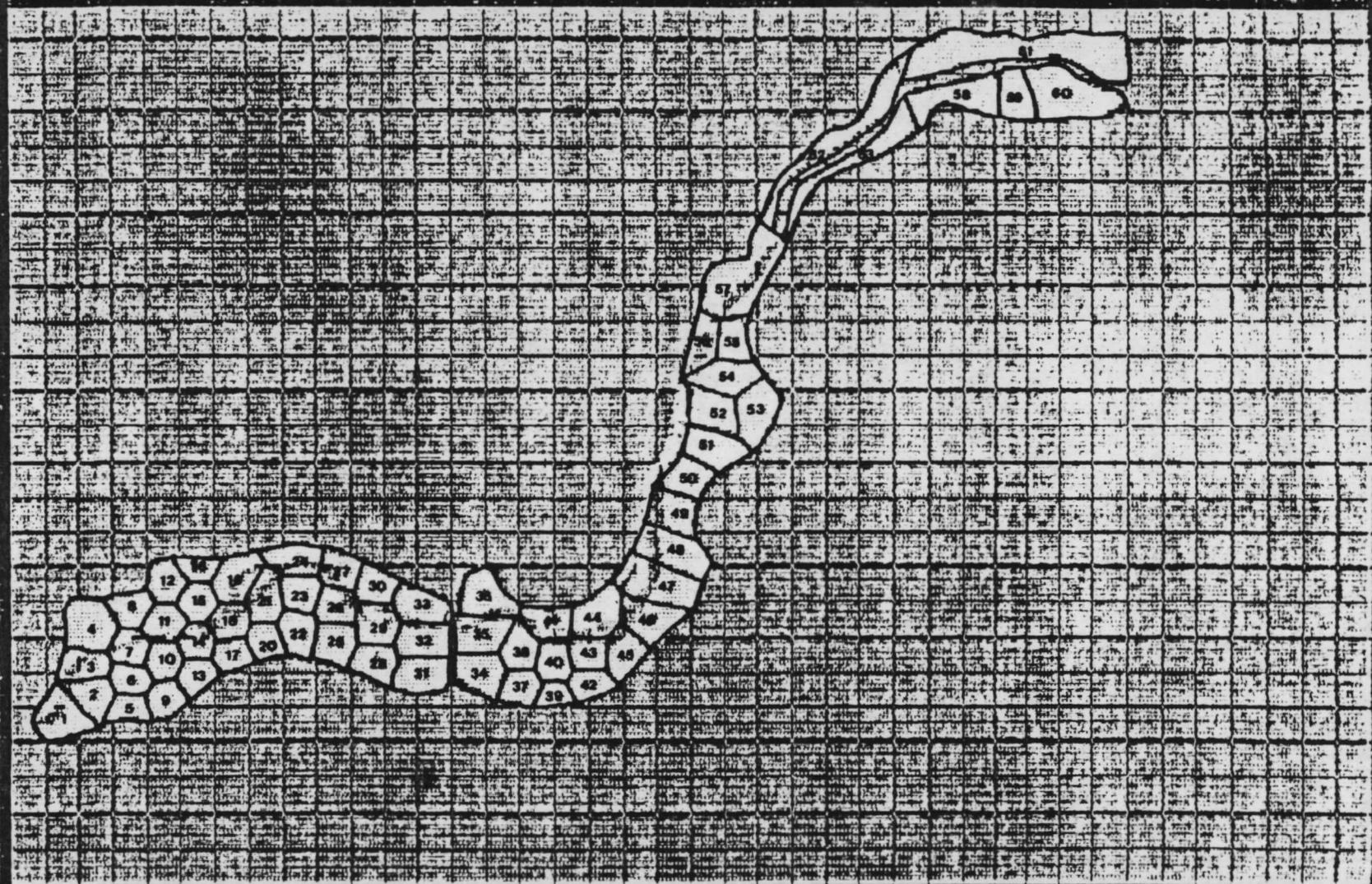


FIGURE 1 Thliessen Areas for 1988 Portage Creek Sediment Stations

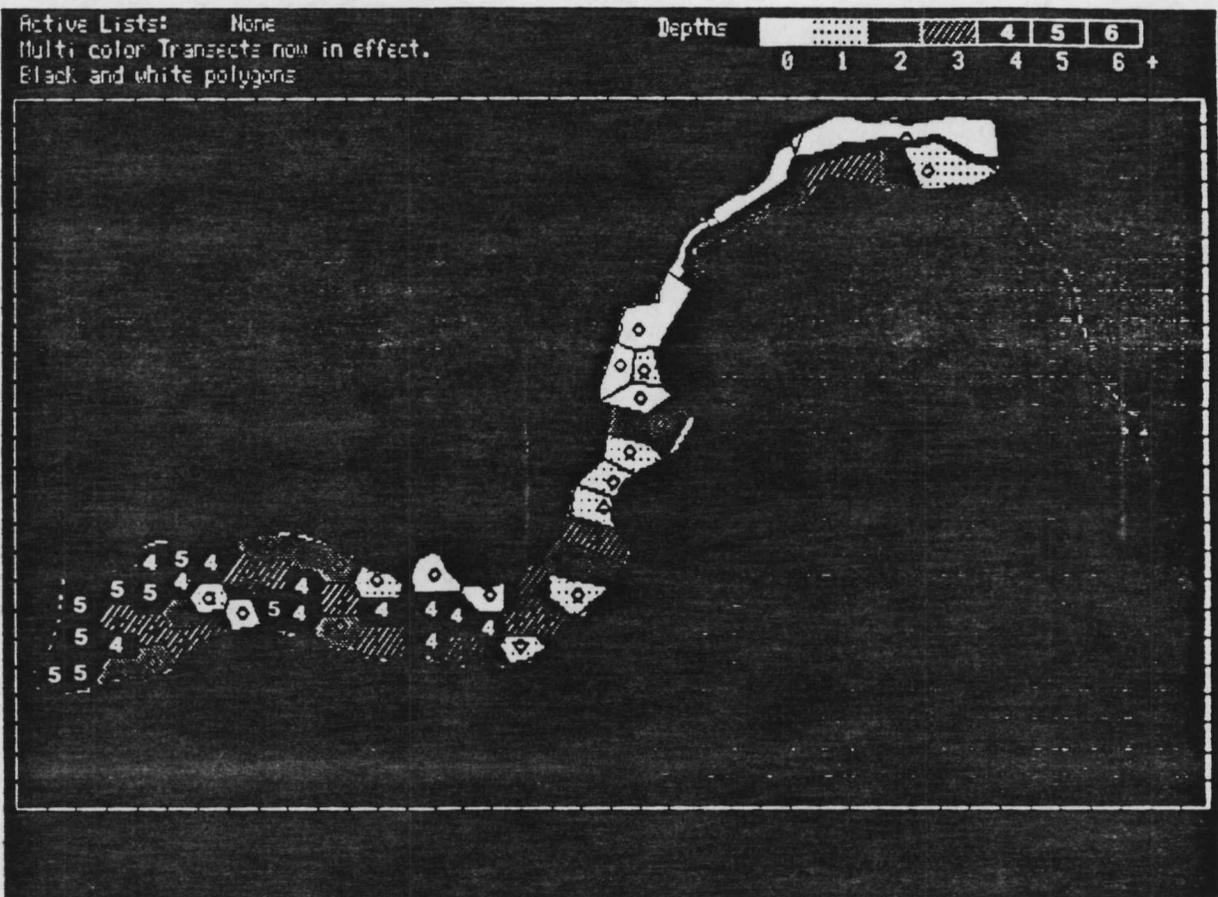


Figure 2 Depth Distribution for Sediment with PCB Concentrations Exceeding 5 mg/kg



Figure 3 Depth Distribution for Sediment With PCB Concentrations Exceeding 10 mg/kg

Active Lists: None
Multi color Transects now in effect.
Black and white polygons

Depths

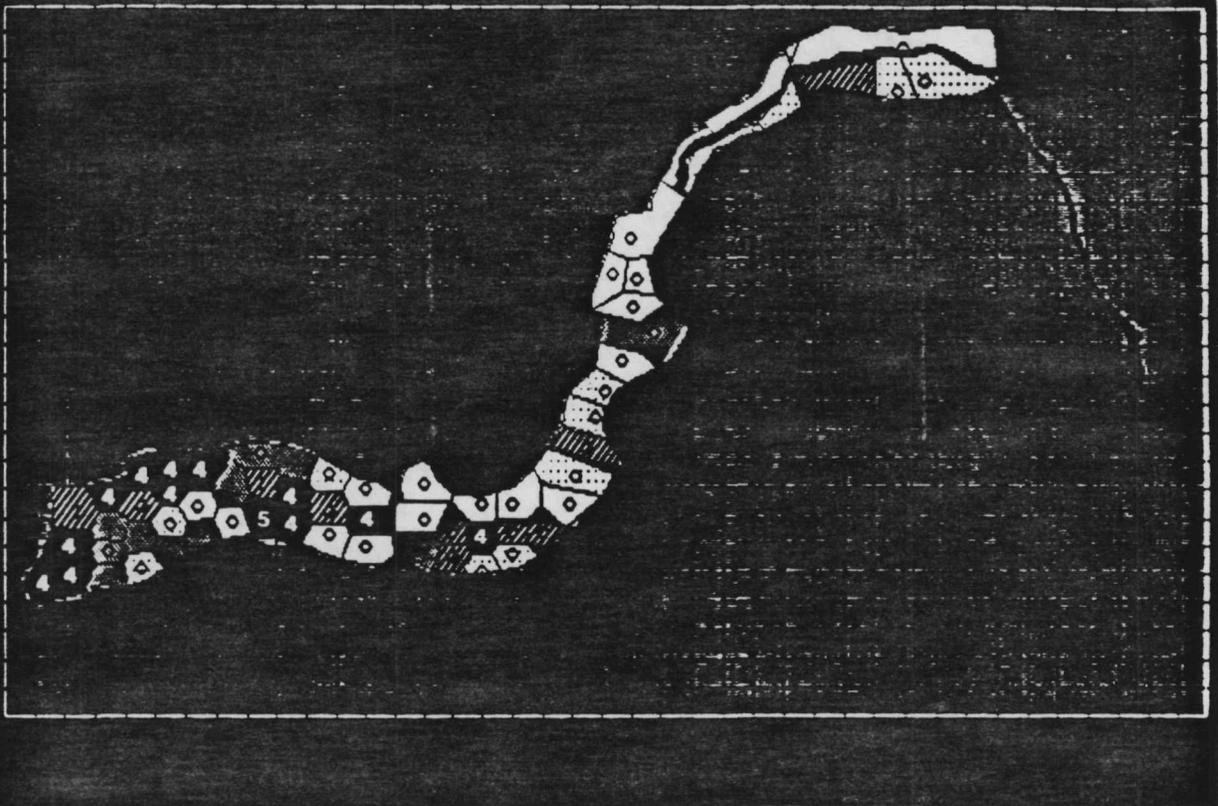


Figure 4 Depth Distribution for Sediment with PCB Concentrations Exceeding 25 mg/kg

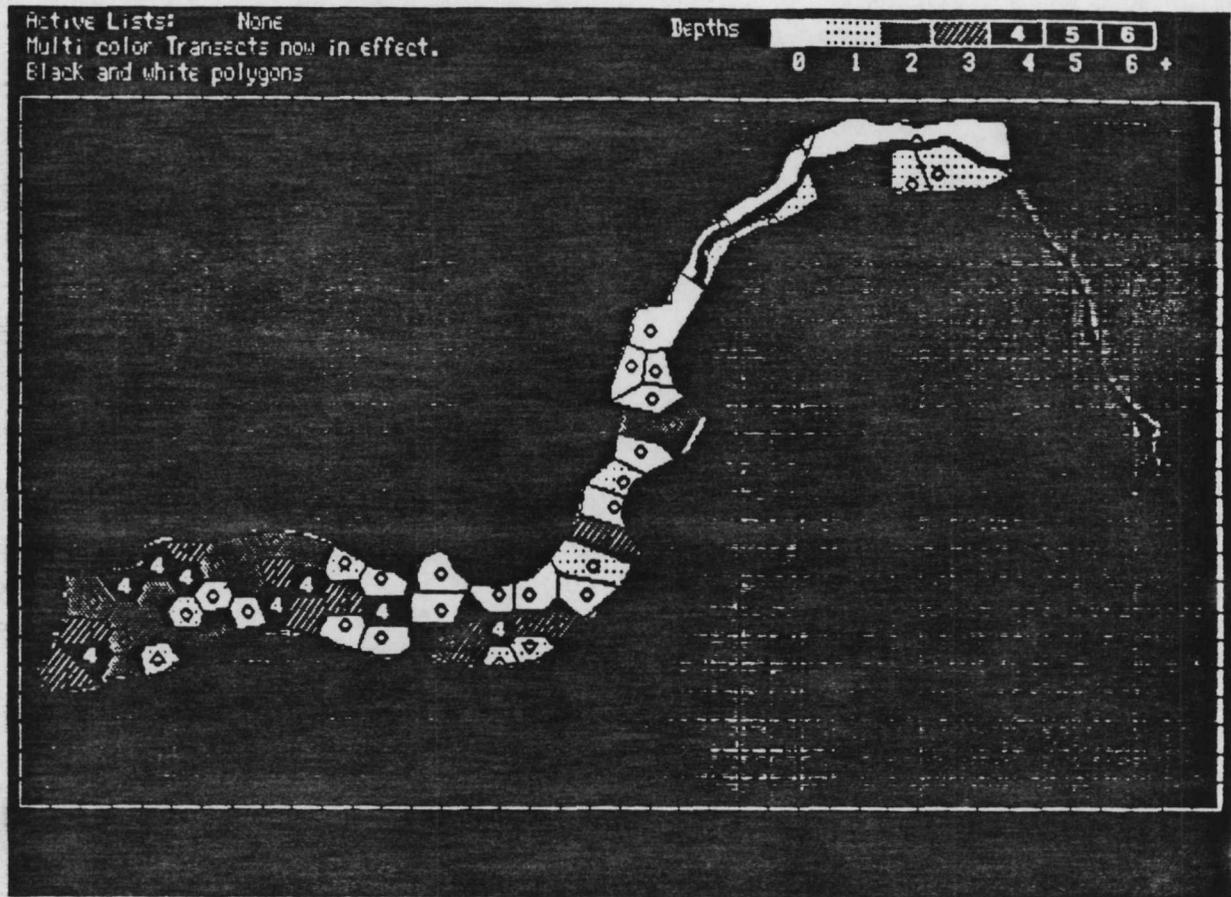


Figure 5 Depth Distribution for Sediment with PCB Concentrations Exceeding 50 mg/kg

Active Lists: None
Multi color Transects now in effect.
Black and white polygons

Depths

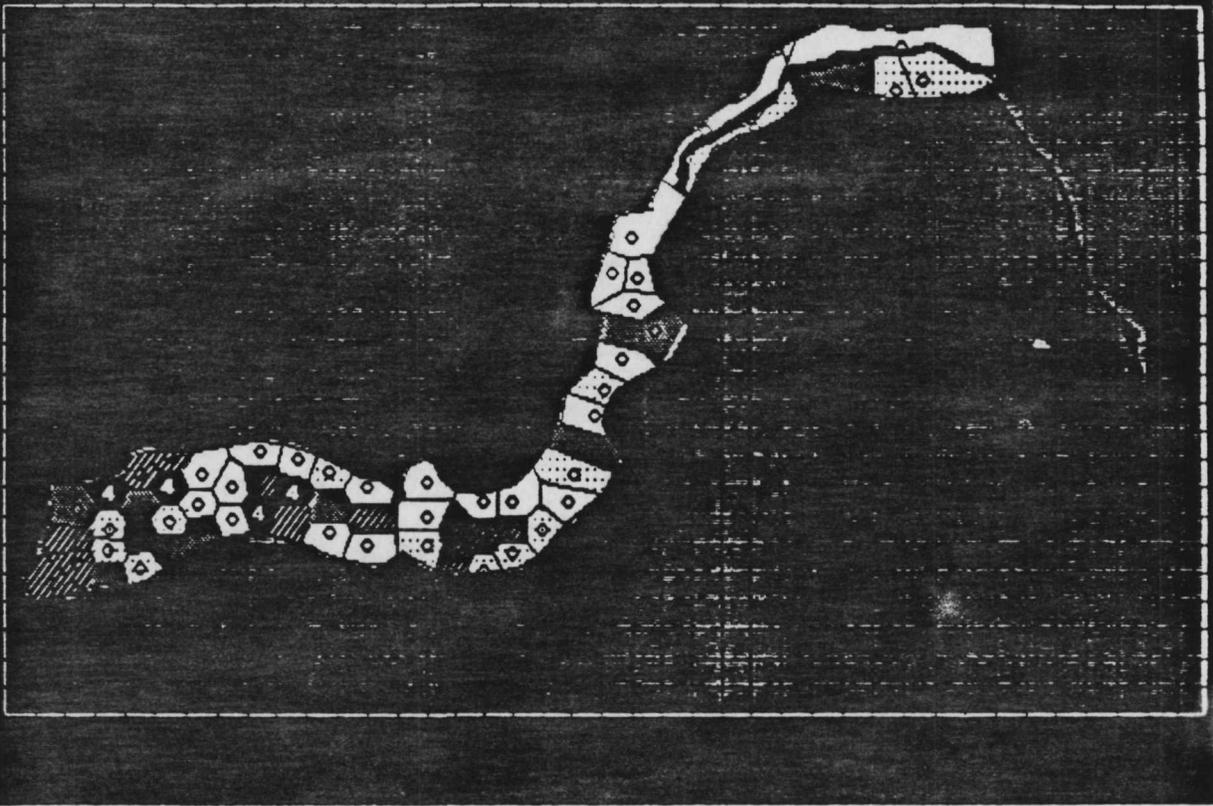
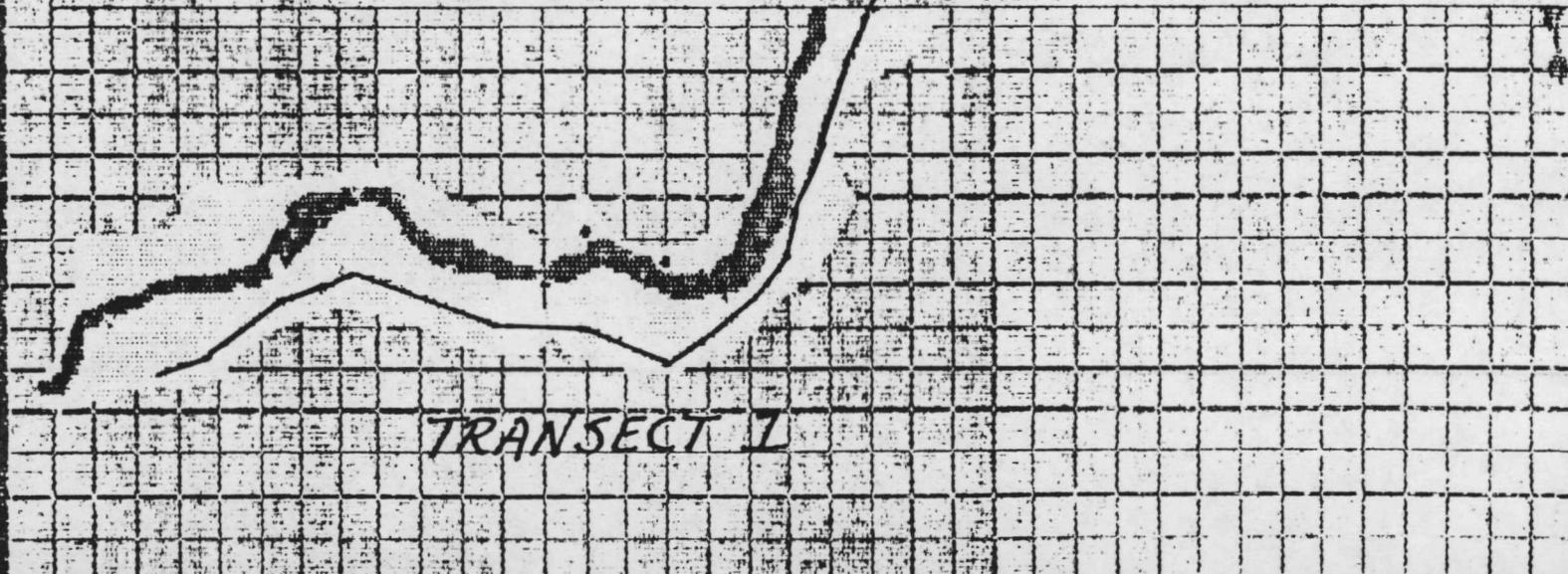
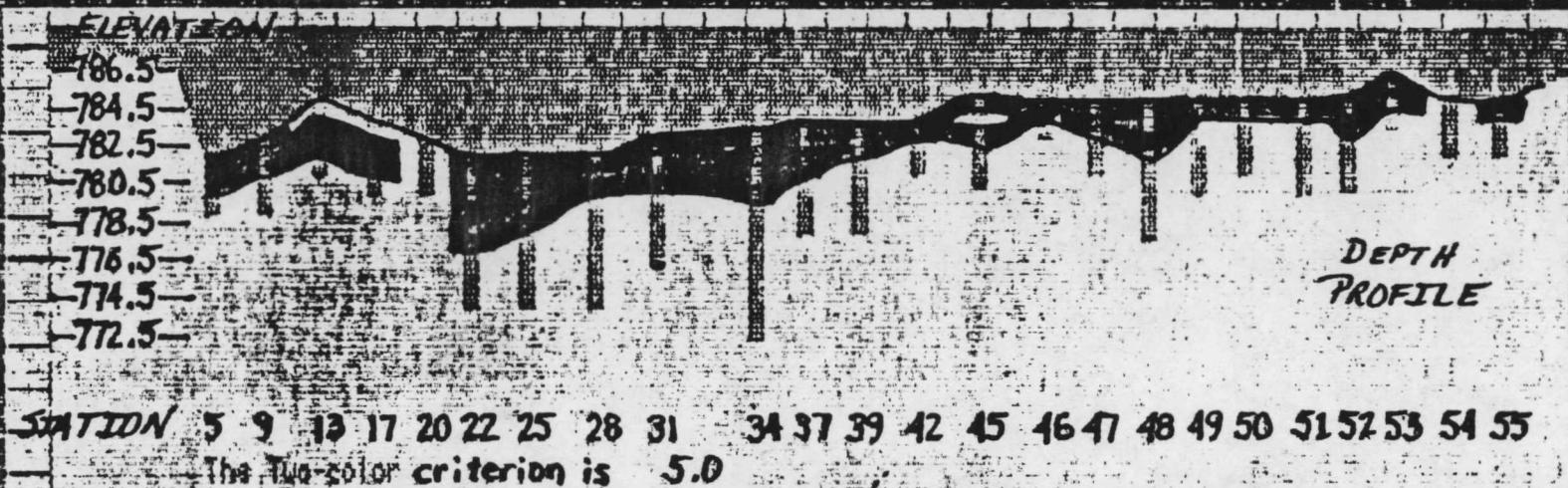


Figure 6 Depth Distribution for Sediment with PCB Concentrations Exceeding 100 mg/kg

ATTACHMENT 2 - PCB Depth Profiles for Specified Transects

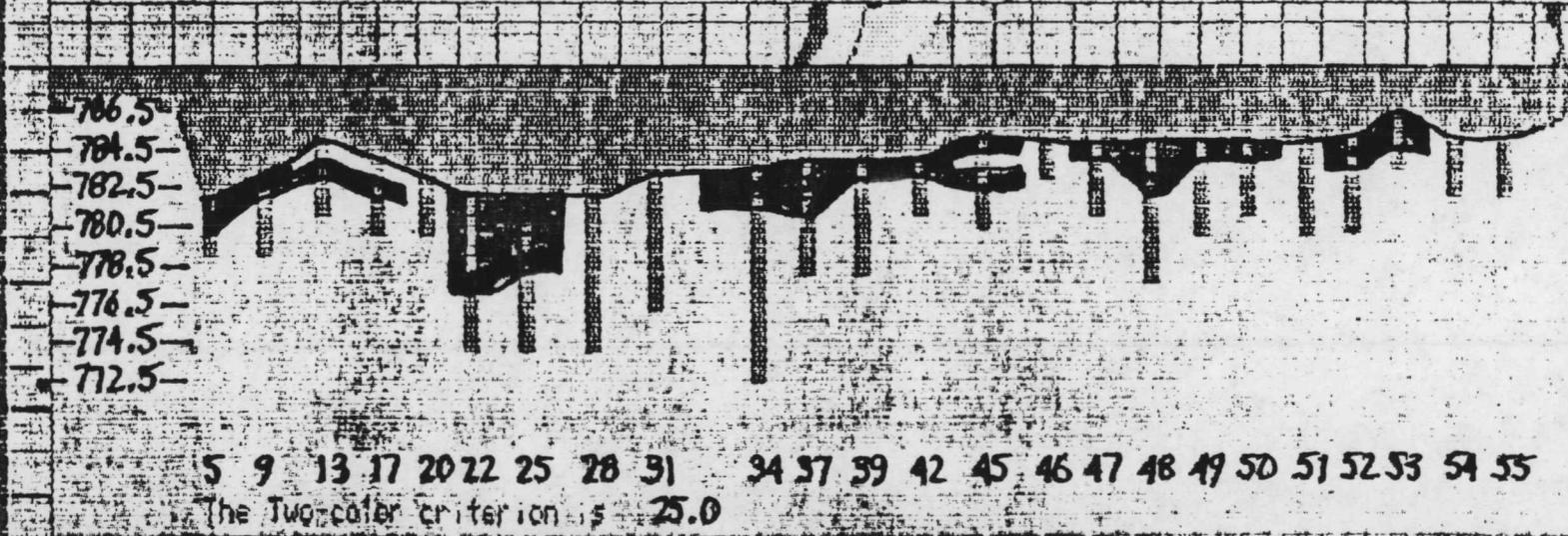
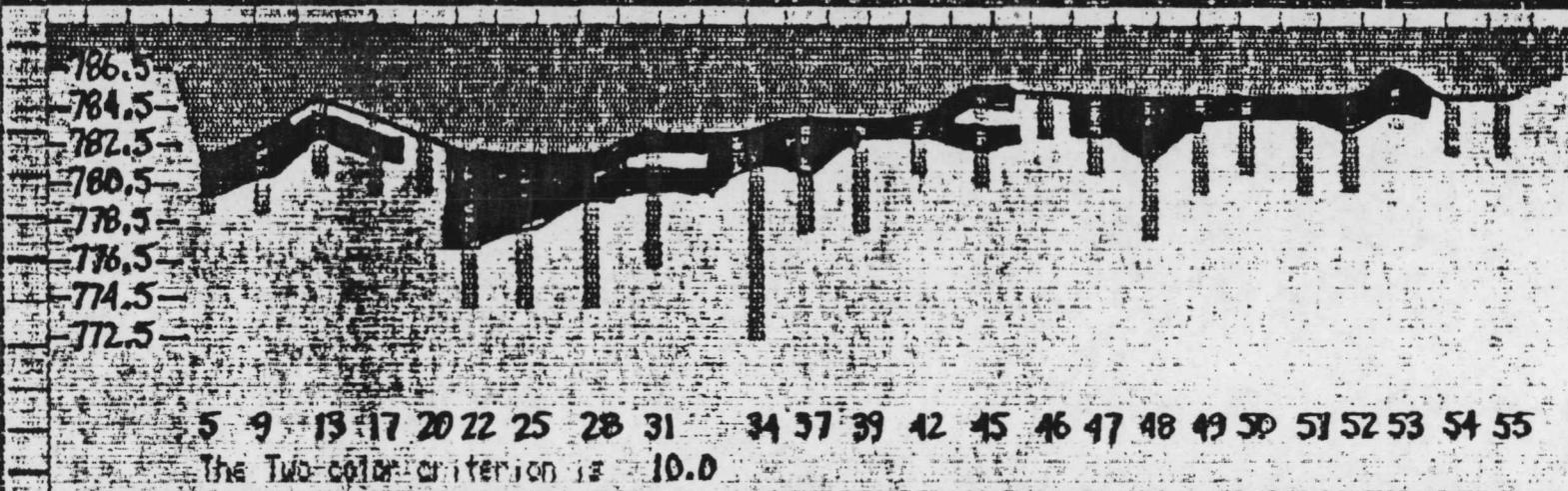
Active Lists: None
Two Color Transects now in effect.
Color polygons



Hit F9 or F10 to erase the top display.

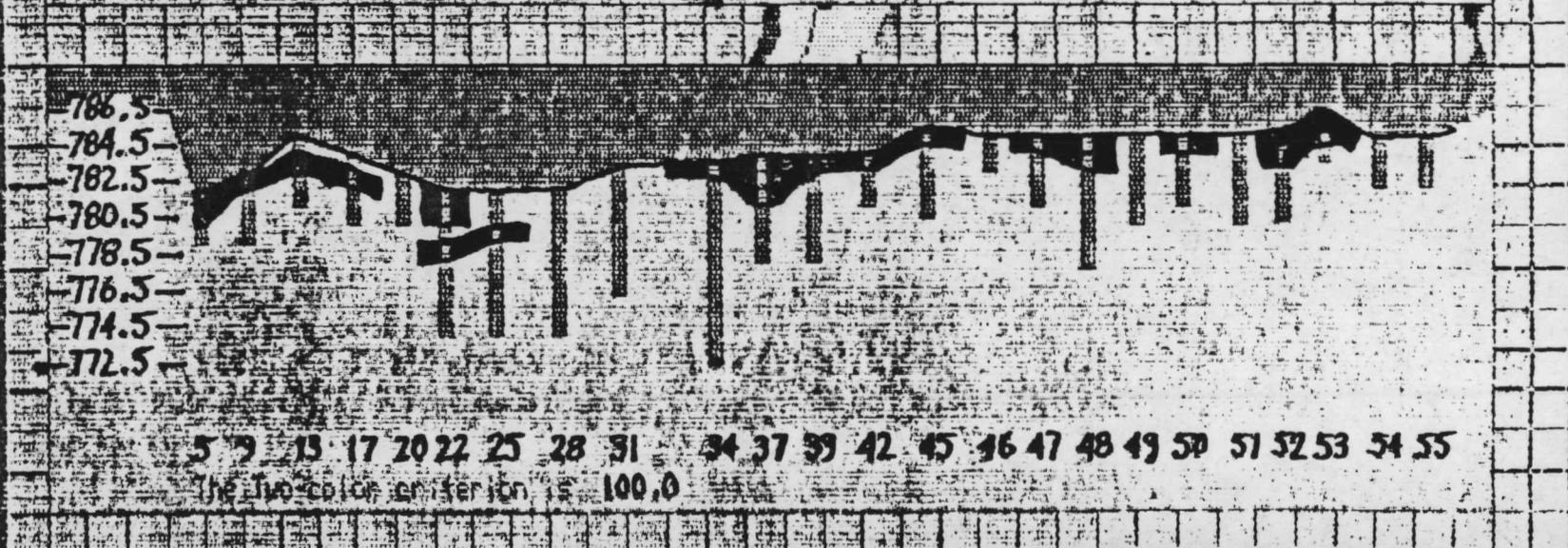
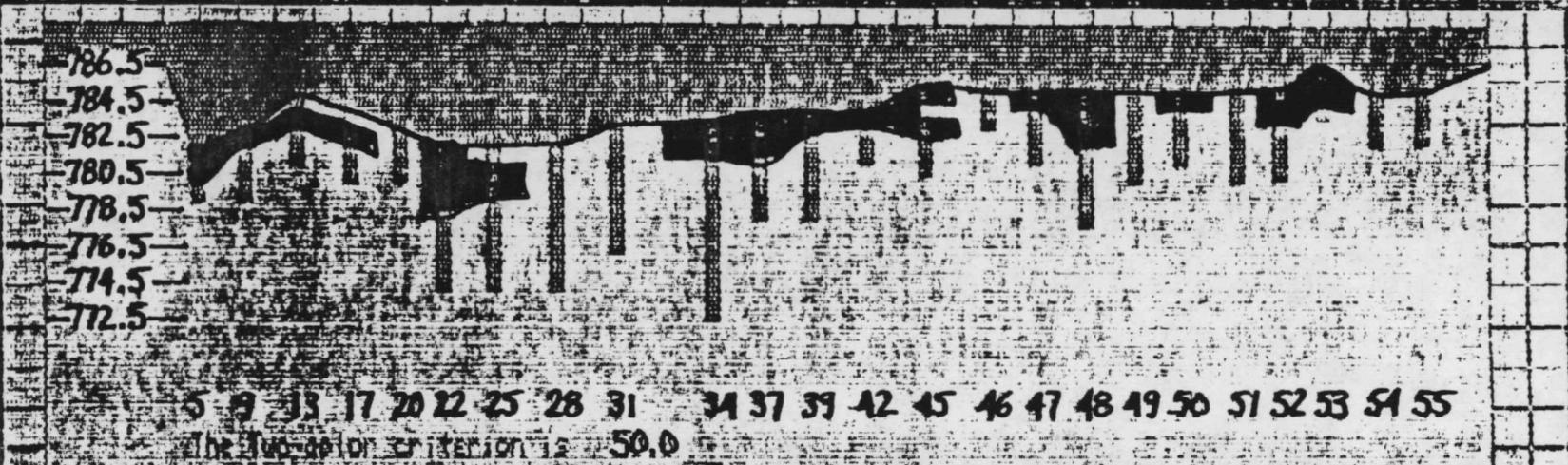
TRANSECT I

Active Lists: None
Two Color: Transects now in effect.
Color polygons



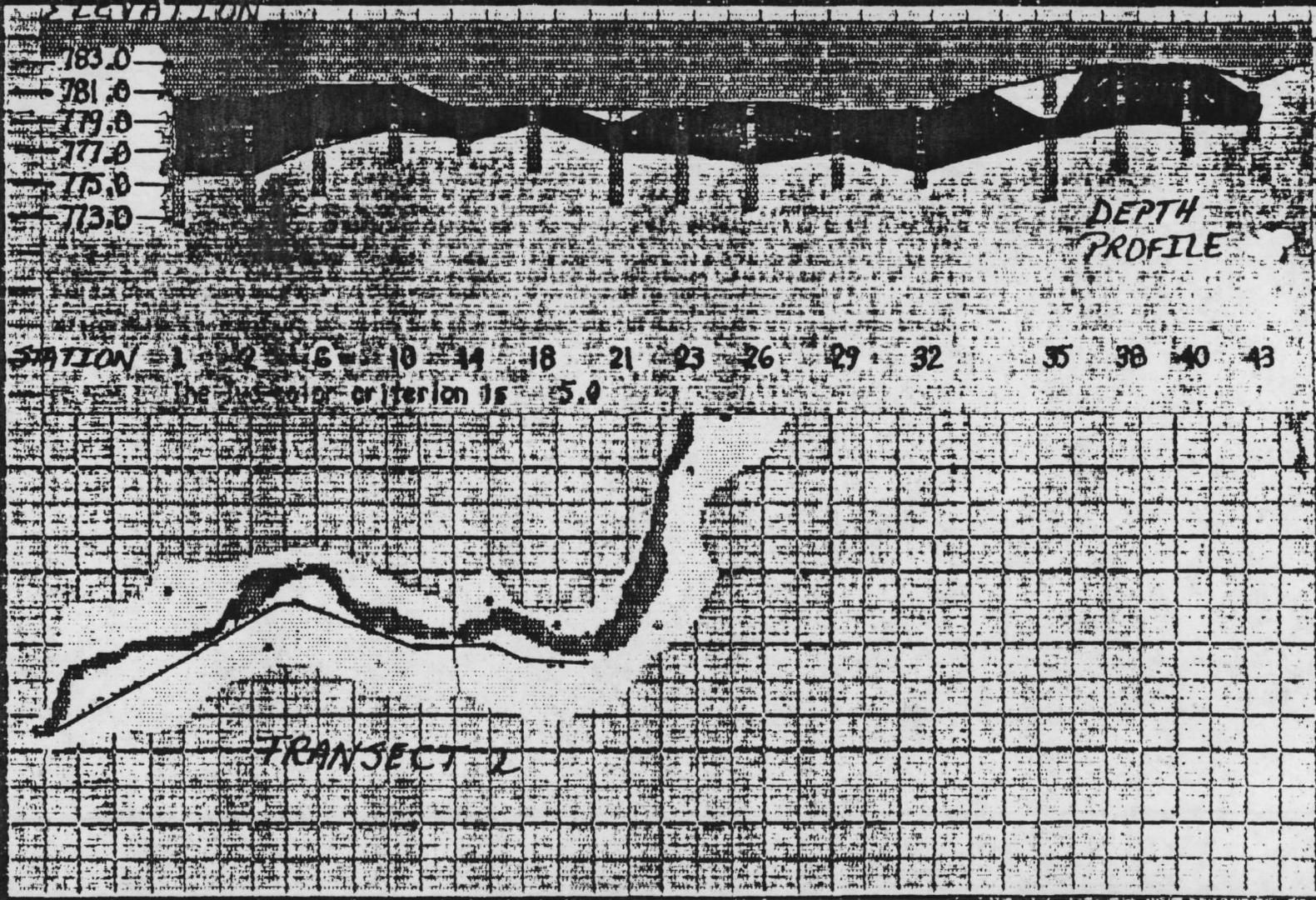
TRANSECT (2.5.80)
Hit F9 to erase the top, Shift F9 to erase the bottom display.

Active Lists: None
Two Color - Transects now in effect.
Color polygons



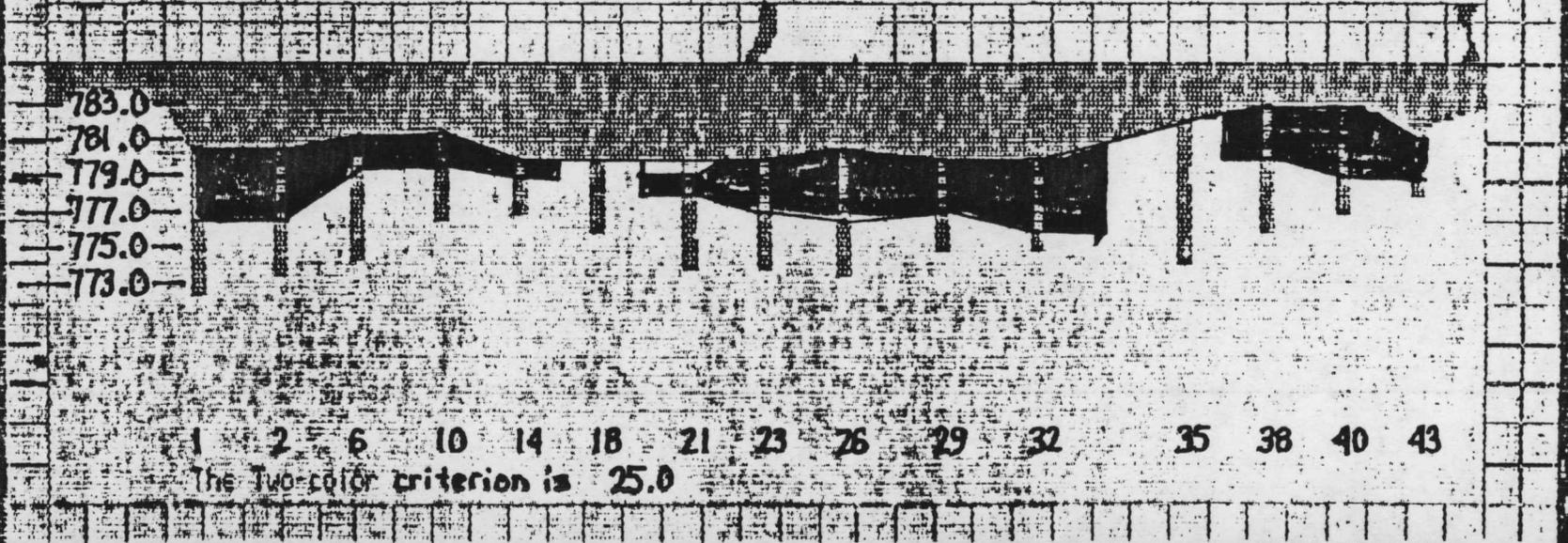
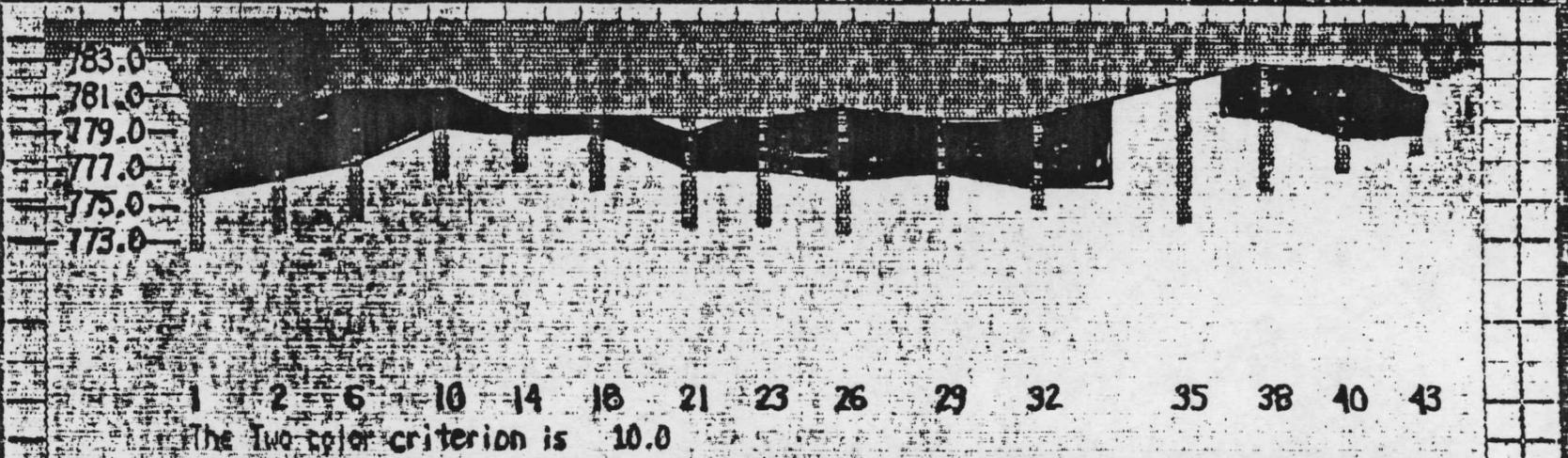
Hit F9 to erase the top, Shift-F9 to erase the bottom display.

Active Lists: None
Two Color: Transects now in effect.
Color polygons



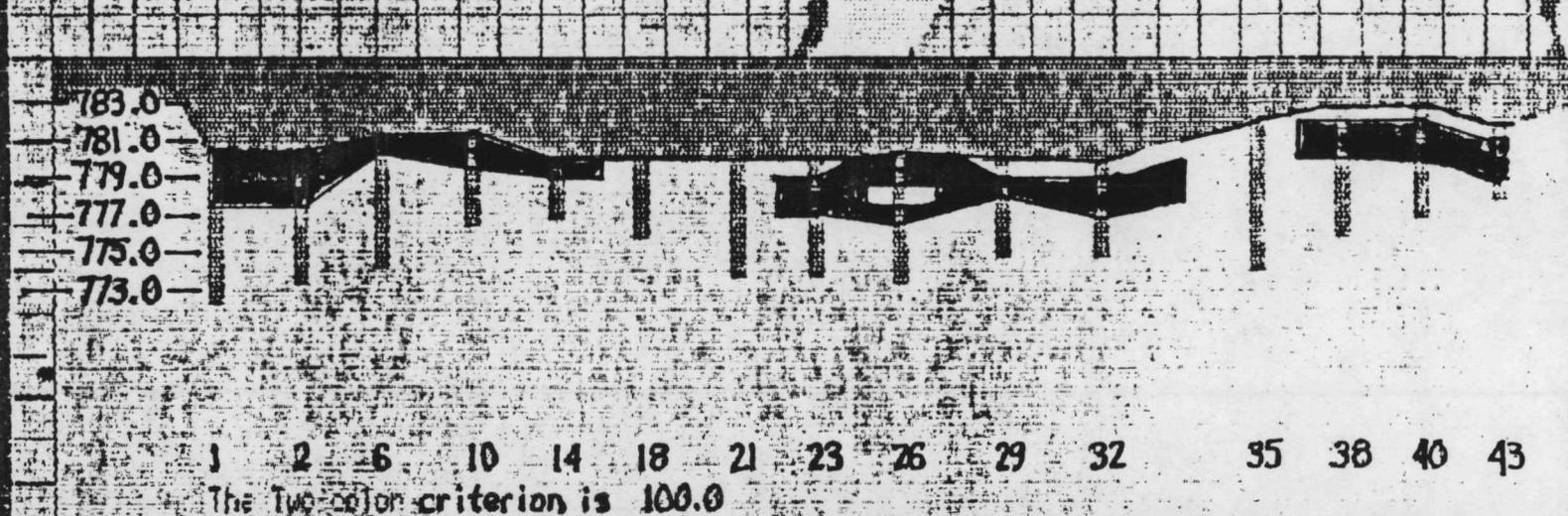
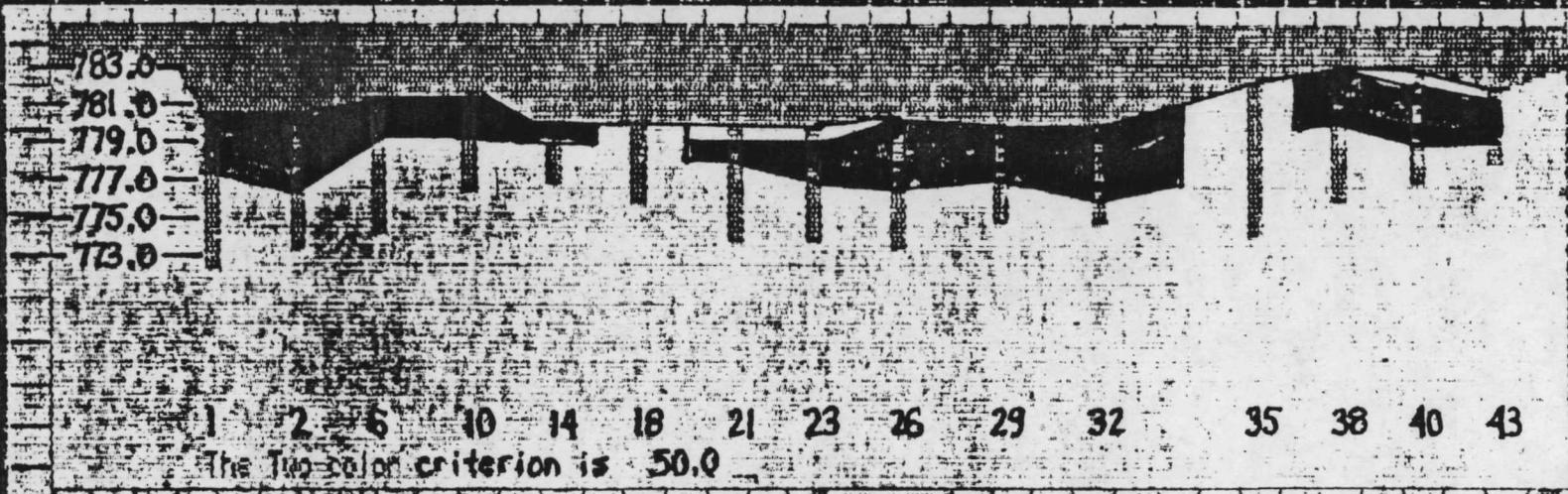
Hit F9 or F10 to erase the top display.

Active Lists: None
Two Color Transects now in effect.
Color polygons



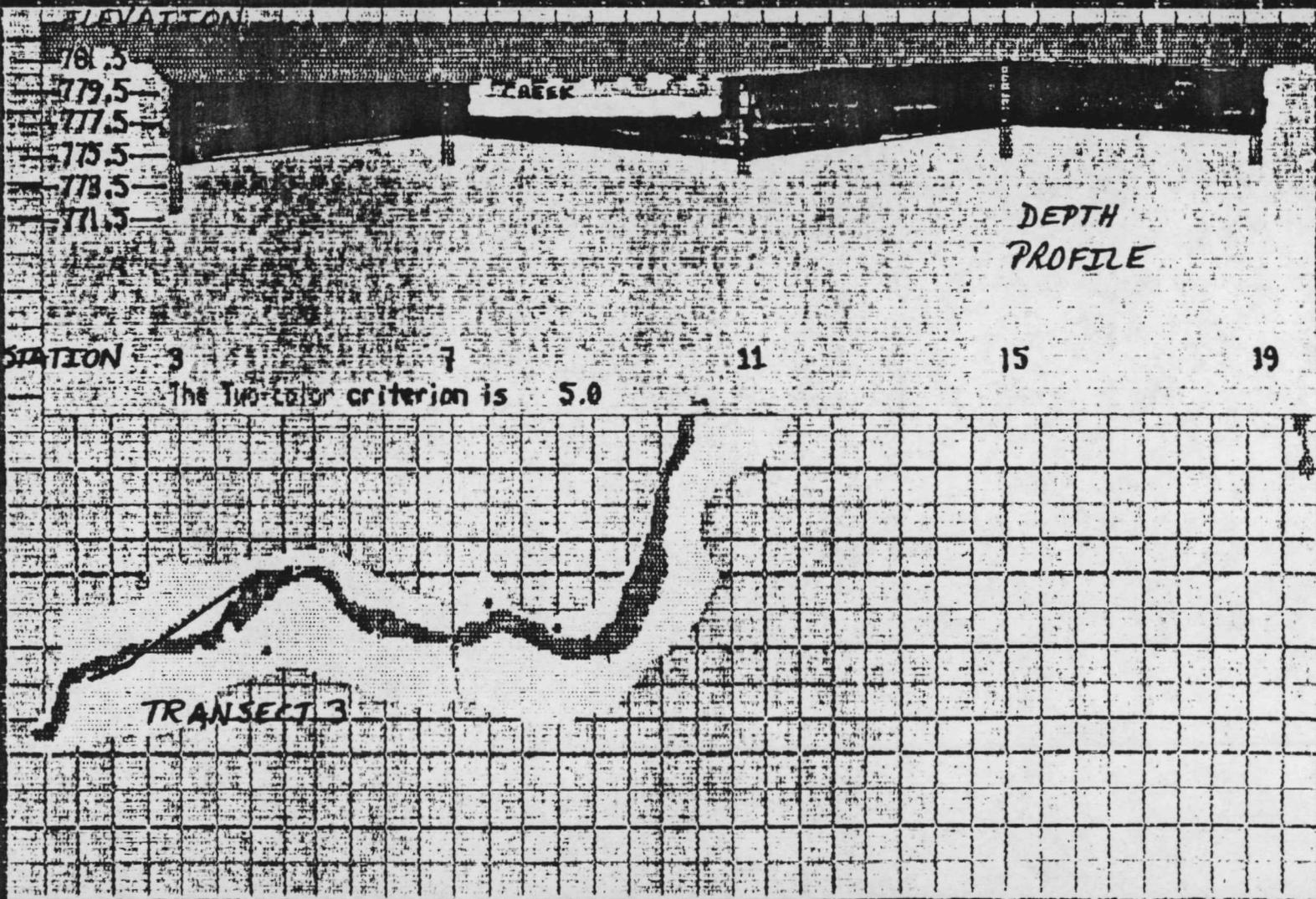
Hit F9 to erase the top, Shift-F9 to erase the bottom display.

Active Lists: None
Two Color: Transects now in effect
Color polygons: [unclear]



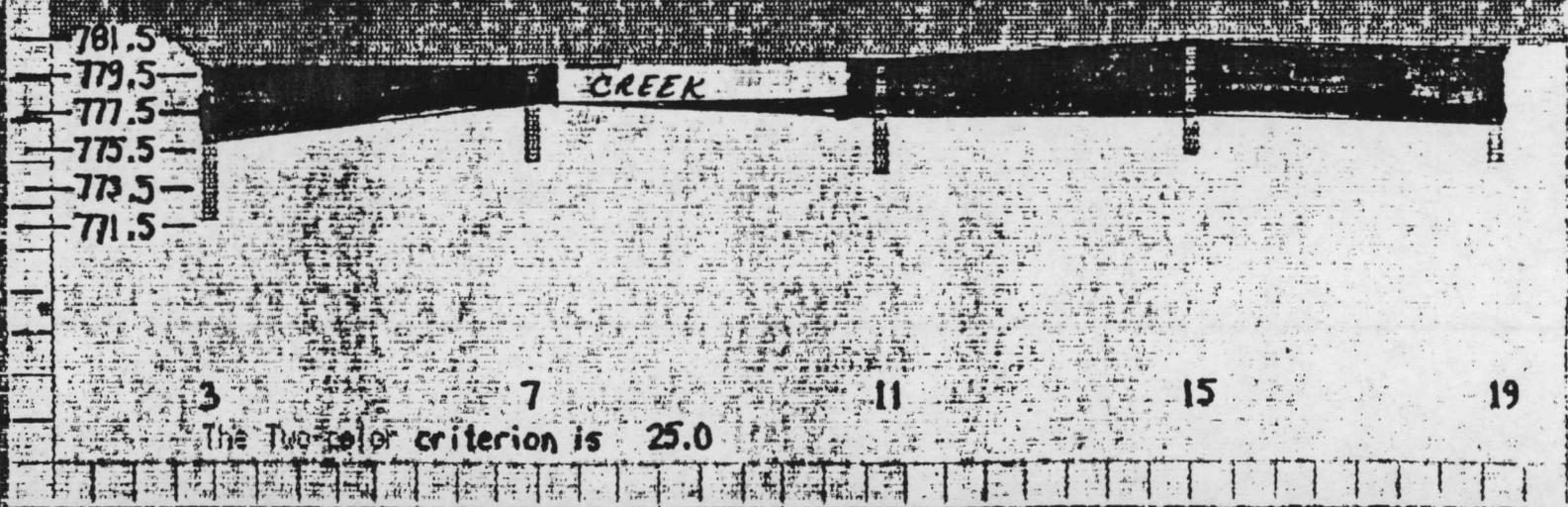
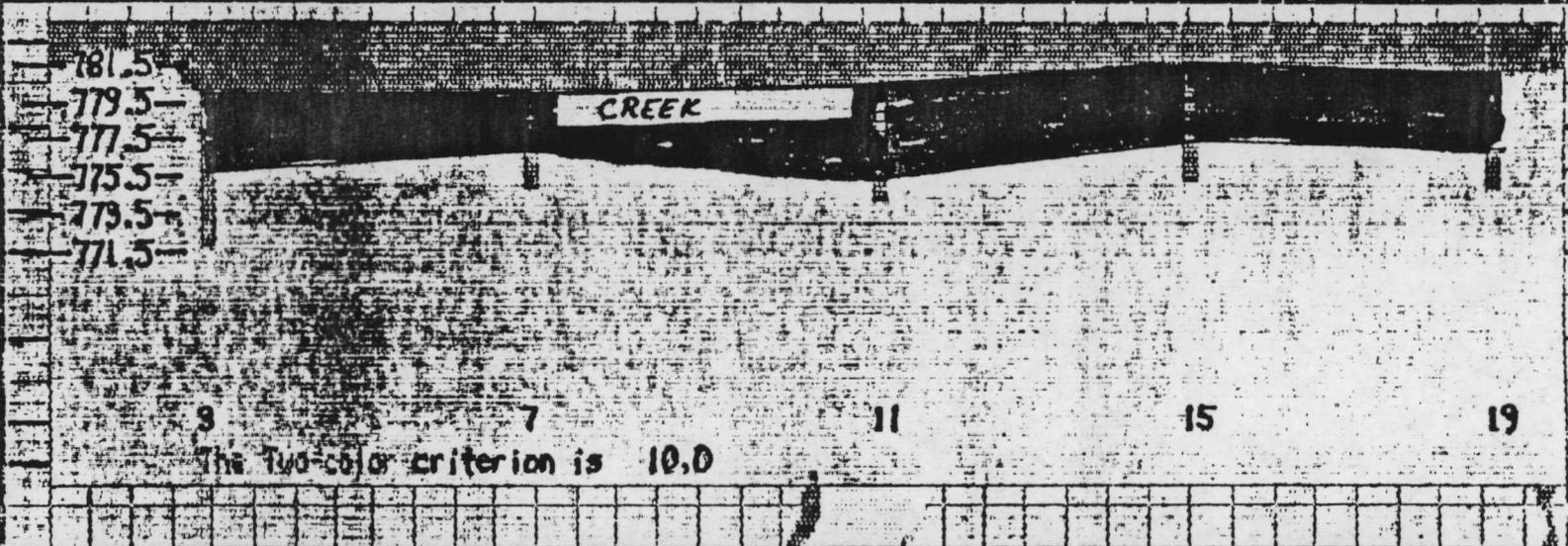
Hit F9 to erase the top, Shift-F9 to erase the bottom display.

Active Lists: None
Two Color: Transects now in effect.
Color polygons



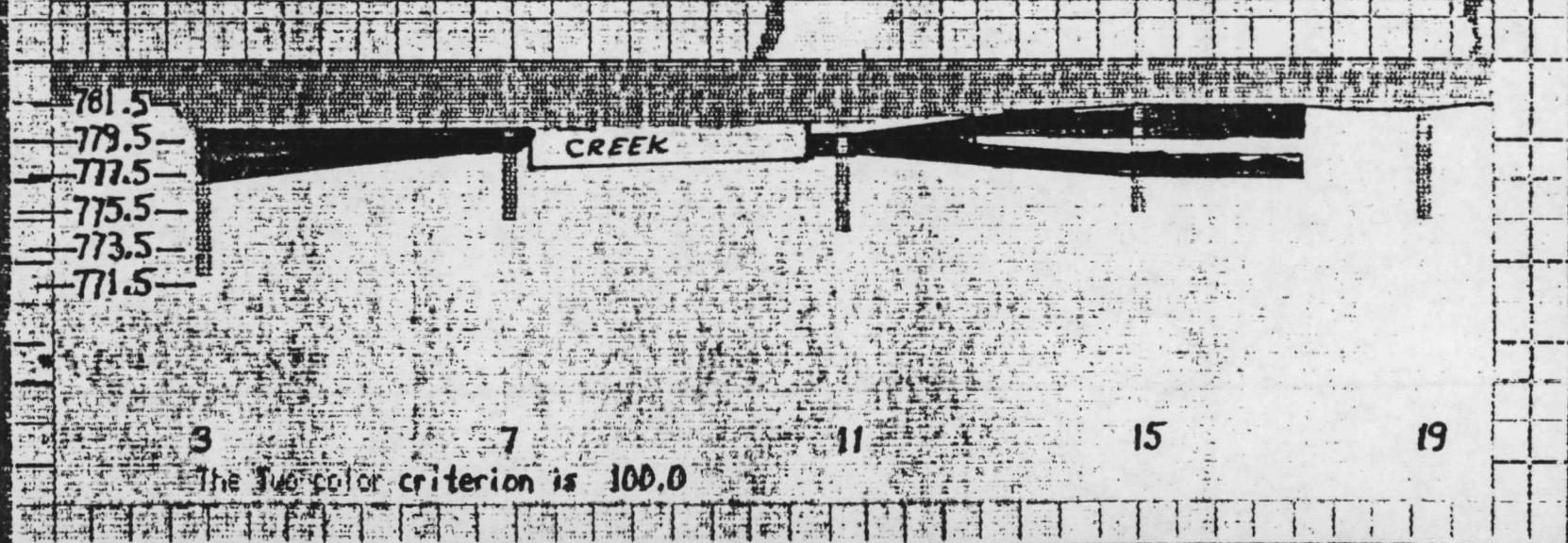
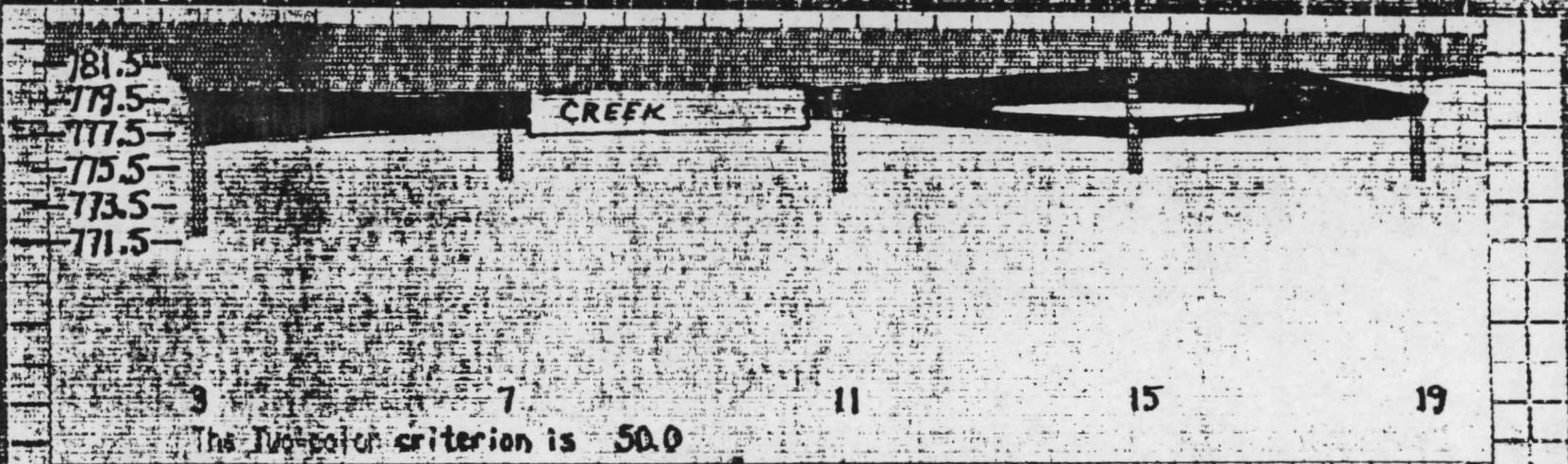
Hit F9 or F10 to erase the top display.

Active Lists: None
Two Color: Transects now in effect
Color polygons



Hit F9 to erase the top / shift-F9 to erase the bottom display

Active Lists: None
Two Color: Transects now in effect
Color polygons:



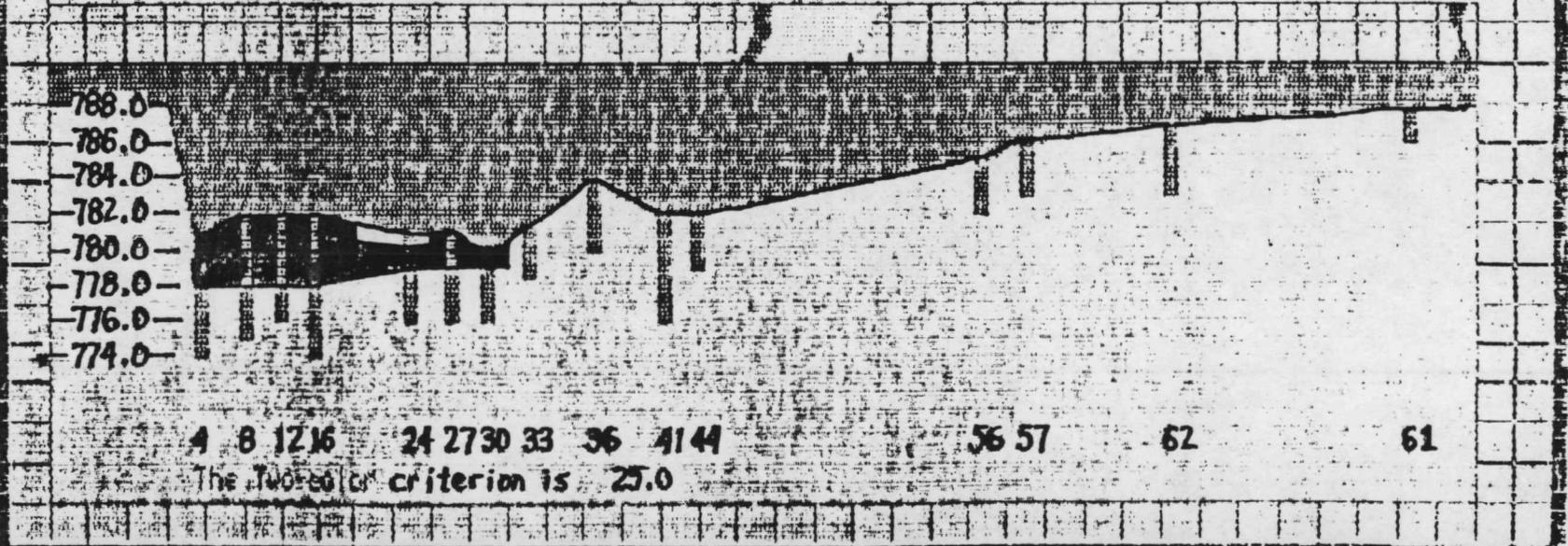
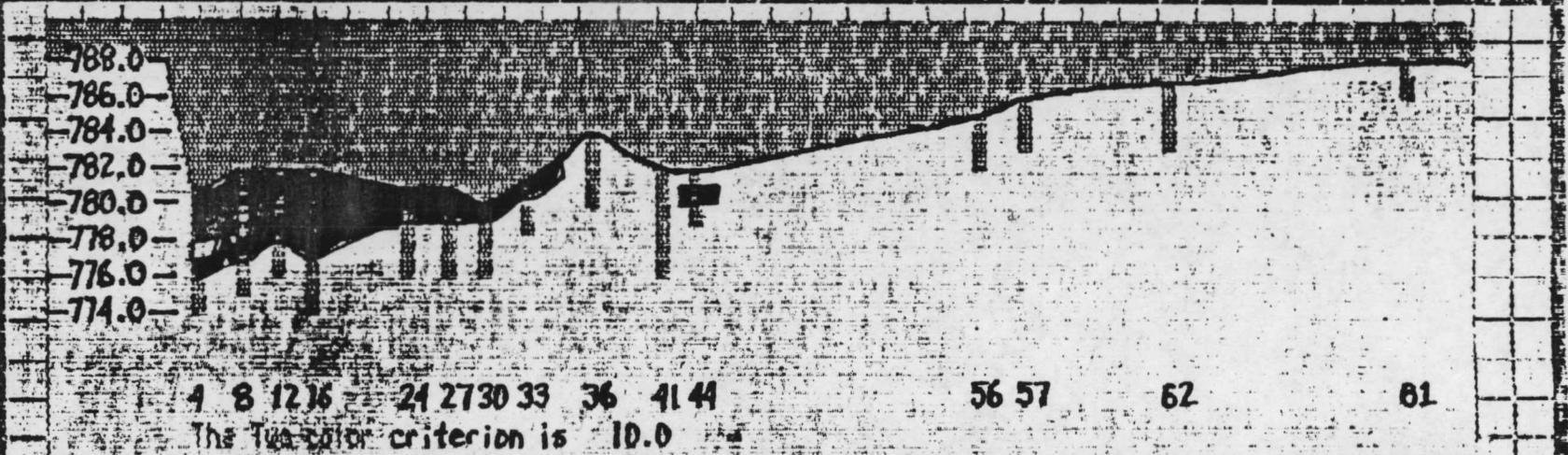
Hit F9 to erase the top, Shift-F9 to erase the bottom display. (LINK ZEP 3 is included)

Active Lists: None
Two Color: Transects now in effect
Color polygons



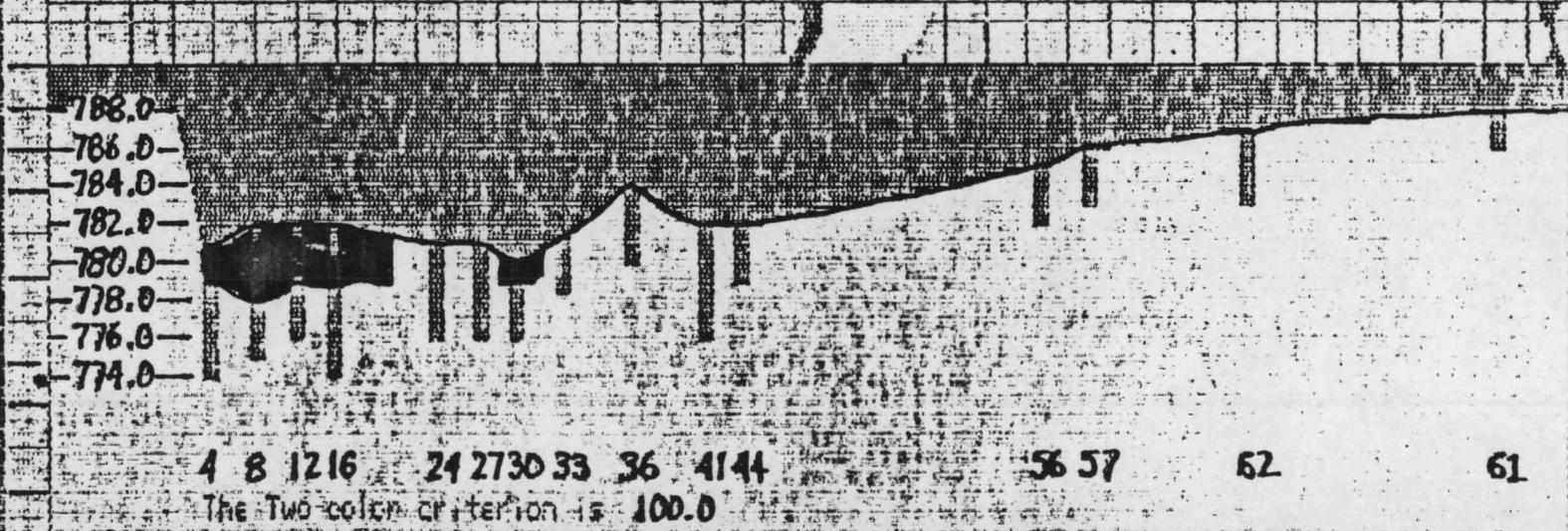
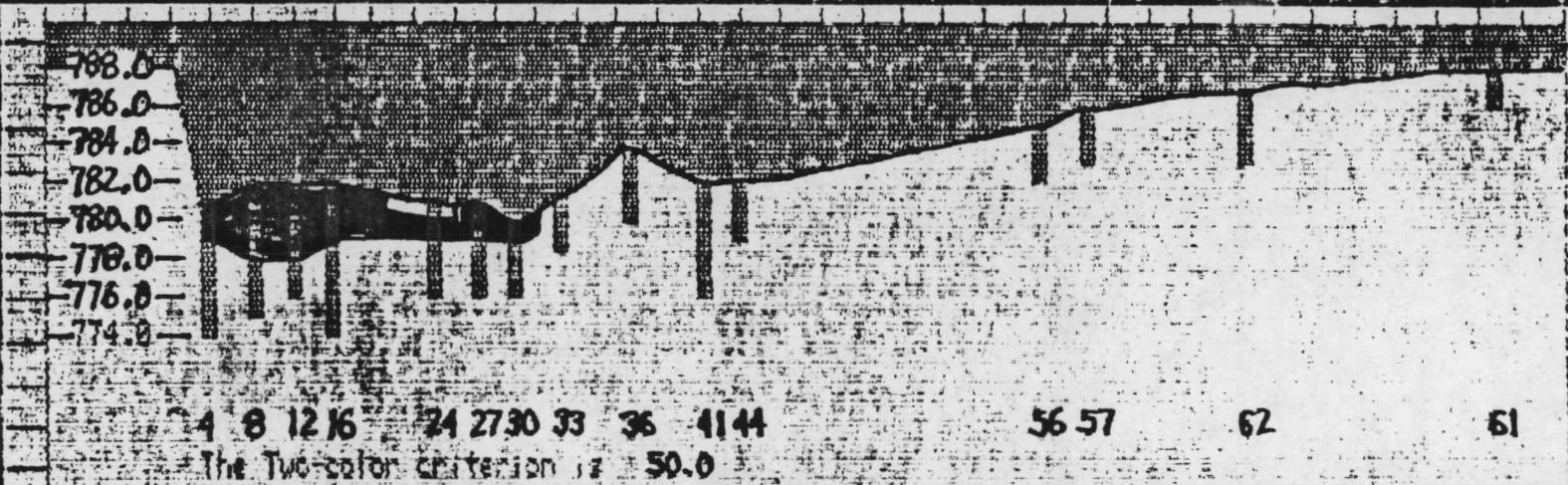
Hit F9 or F10 to erase the top display.

Active Lists: None
Two Color: Transects now in effect.
Color polygons:



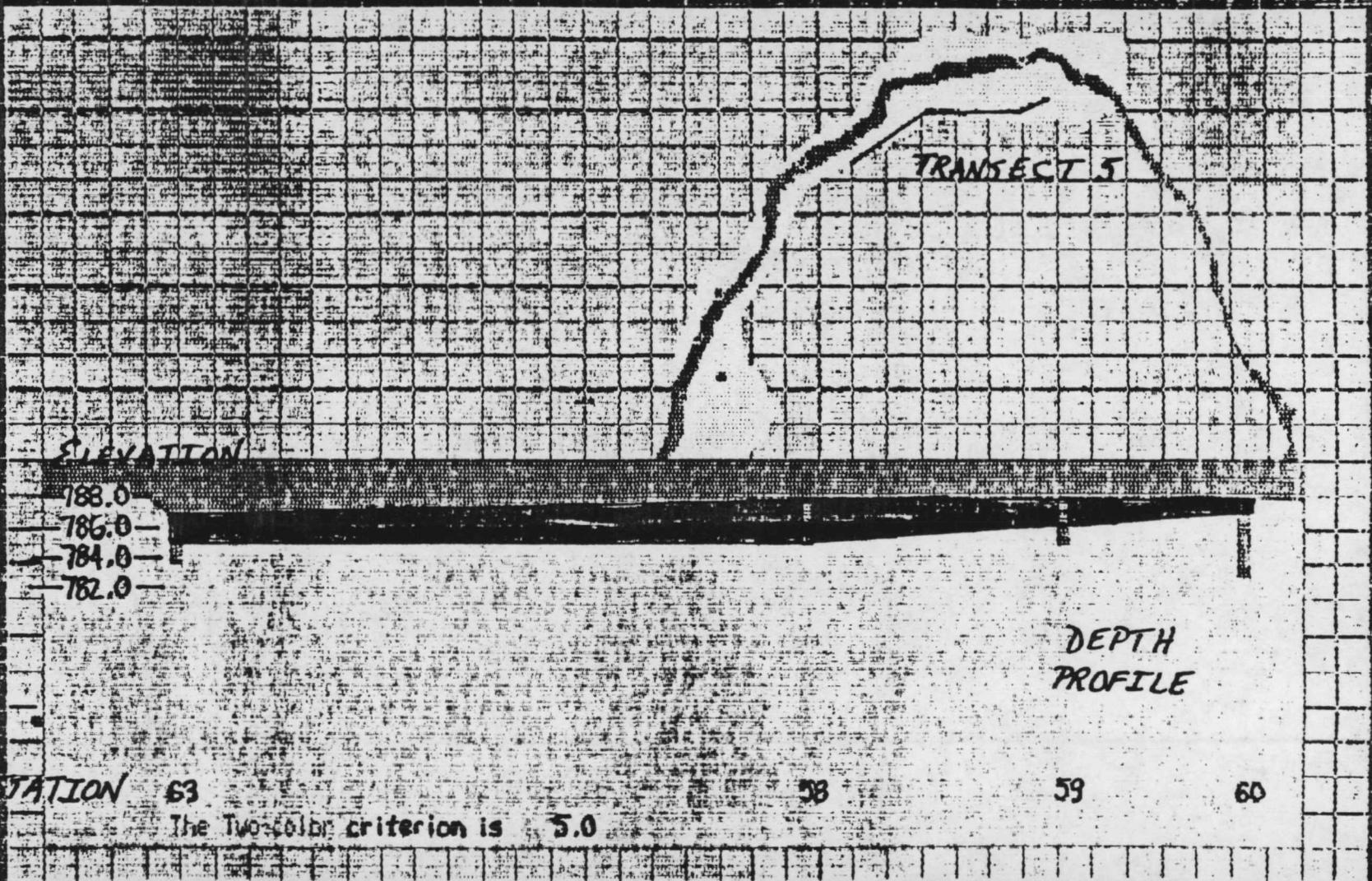
Hit F9 to erase the top, Shift-F9 to erase the bottom display.

Active Lists: None
Two Color Transsects now in effect.
Color polygons



Hit F9 to erase the top, Shift-F9 to erase the bottom display.

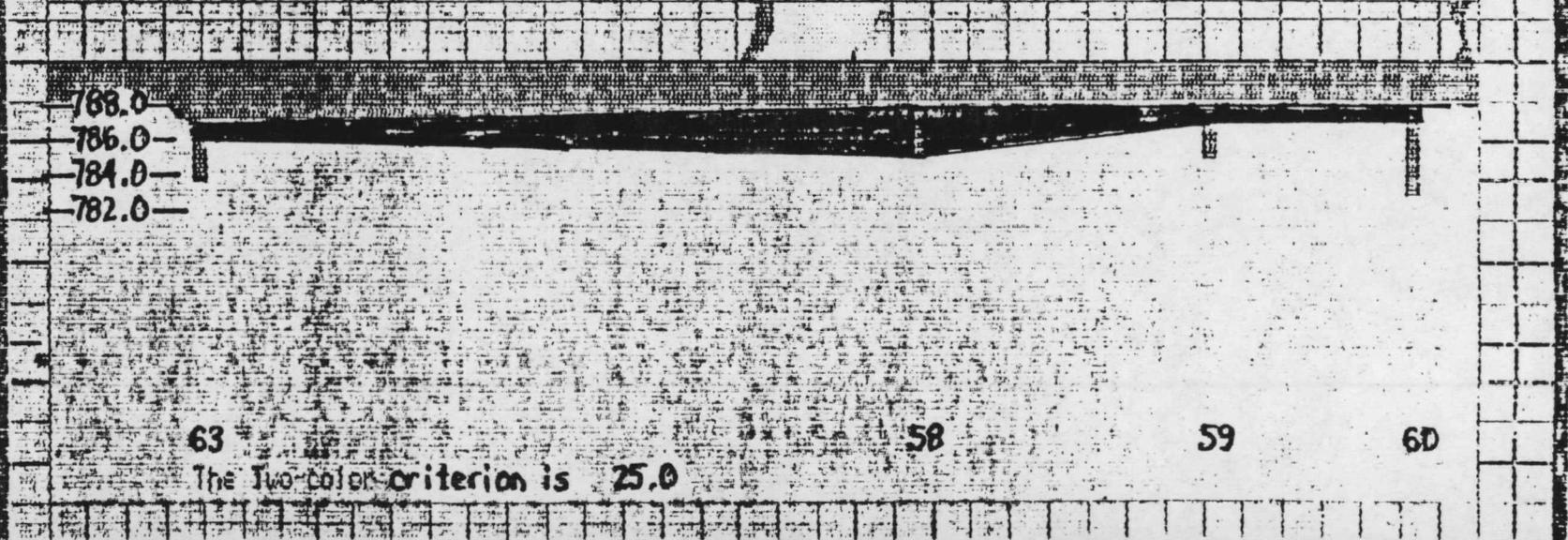
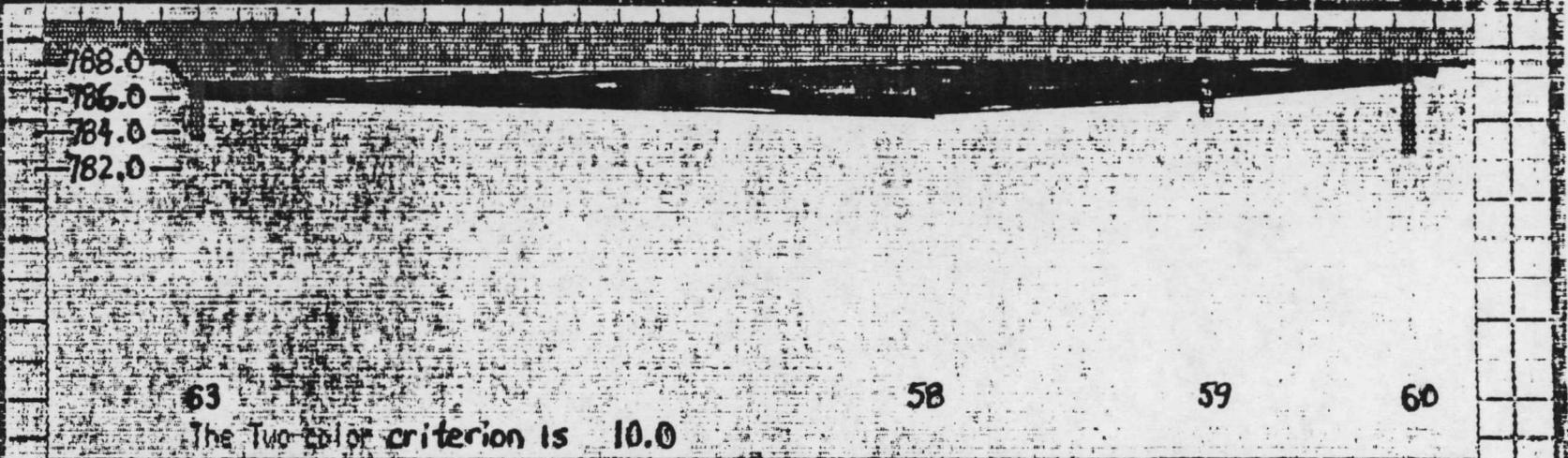
Active Lists: None
Two Color: Transects now in effect.
Color polygons



The Two-color criterion is 5.0

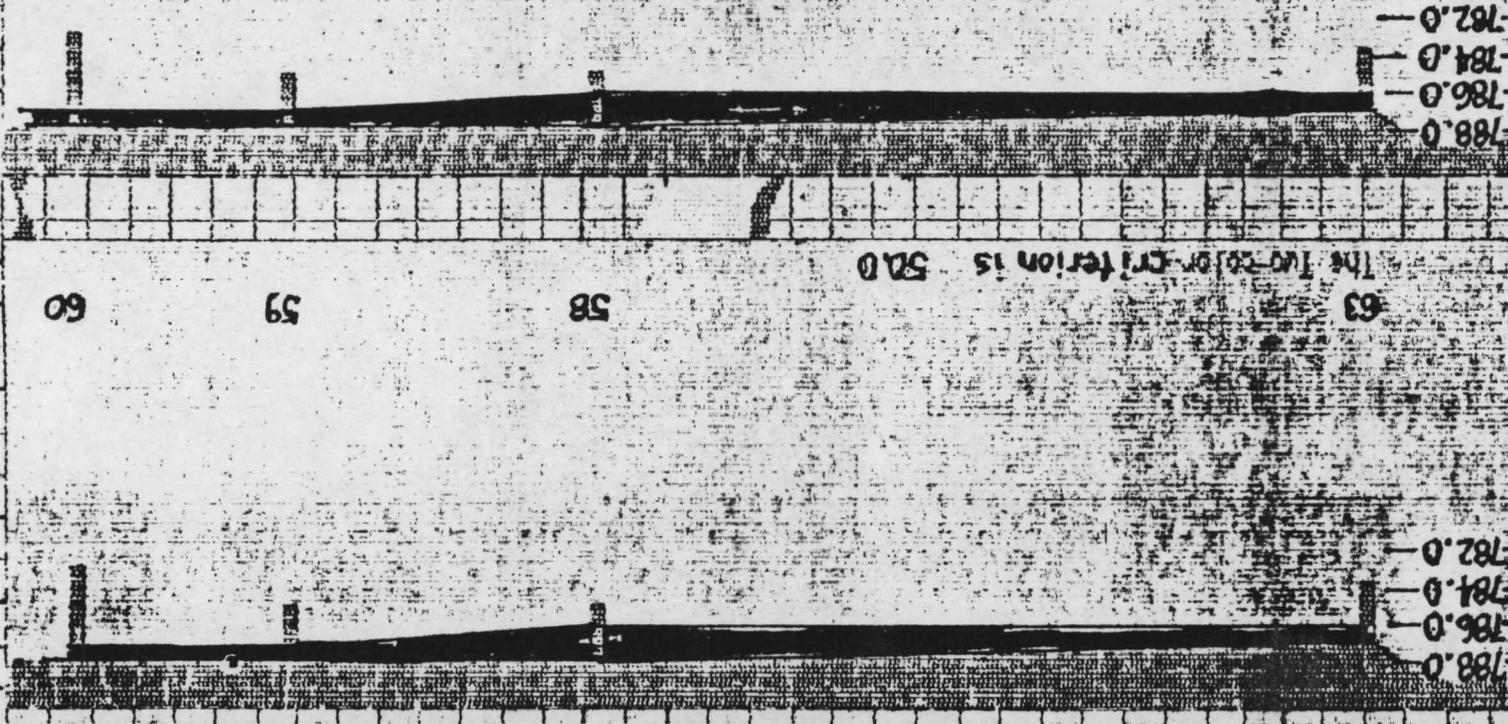
Hit Shift-F9 or Shift-F10 to erase the bottom display.

Active Lists: None
Two Color: Transects now in effect.
Color polygons



Hit F9 to erase the top, Shift-F9 to erase the bottom display.

Active Lists: None
Two Color Transacts now in effect.
Color polygons



The two-color criterion is 100.0

63 58 59 60

HIT F9 to erase the top, Shift-F9 to erase the bottom display.

ENCLOSURE (included)

ATTACHMENT 3 - Graphical Summary of PCB Concentrations vs. Depths

ATTACHMENT 4 - Summary of 1988 Portage Creek Sediment PCB Data

Sample	(PCB) (ng/kg) (dry wt)	Adjusted Dry Dens (g/cc)	Oil/Grease Odor	Soil Characteristics
=====	=====	=====	=====	=====
1-1	3.6	1.193		Brown silt with clay binder
1-2	260	0.587		Dark gray clayey silt
1-3	310	0.515	x	Dark gray/black clayey silt
1-4	44	0.551	xx	Dark gray/black clayey silt w/ OM
1-5	18	0.448	xx	Dark gray/black clayey silt
1-6	4.5	0.705	xx	Dark gray/black clayey silt
1-7	--		xx	Dark brown/black peat/clay/silt/trace sand
1-8	--		x	Dark brown/black peat/clay/silt/trace sand
2-1	100	0.609		Brown/gray clayey silt
2-2	180	0.610	x	Gray clayey silt
2-3	300	0.645	xx	Dark gray clayey silt
2-4	94	0.448	xx	Sand/black silt/dark gray clay
2-5	6.4	0.664	xxx	Dark gray silty clay
2-6	1.8	0.705	xxx	Dark gray silty clay
2-7	nd	0.481		Dark brown silty clay/OM
3-1	280	0.583		Dark gray/brown silty clay
3-2	340	0.583		Gray clayey silt
3-3	450	0.569	xxx	Dark gray/black silty clay
3-4	43	0.533	xxx	Dark gray/black silty clay
3-5	7.6	0.415	xxx	Black silty clay
3-6	--		xxx	Black silty clay
3-7	--		x	Black silty clay
3-8	--		x	Brown/black peaty sandy silt
4-1	130	0.556		Dark gray silty clay
4-2	180	0.481		Dark gray silty clay
4-3	29	0.569		Dark gray silty clay
4-4	9.4	0.415	xxx	Very dark gray silty clay
4-5	13	0.587	xxx	Very dark gray silty clay
4-6	nd	0.664	xxx	Very dark gray silty clay
4-7	nd	0.515		Very dark brown/gray sand/silt/OM
5-1	390	0.464		Brown silt / gray silty clay
5-2	360	0.464		Gray silty clay
5-3	nd	0.533	xxx	Gray silty clay / Gravel Refusal
6-1	230	0.369		Very dark gray silty clay/OM
6-2	59	0.515	xxx	Very dark gray silty clay/OM
6-3	14	0.339		Very dark gray/black silty clay
6-4	13	0.339		Very dark gray/black silty clay
6-5	nd	0.664	xxx	Dark gray silty clay
6-6				
6-7	--			Brown clayey peat
7-1	410	0.583		Dark brown silt / gray clayey silt
7-2	58	0.625		Gray clayey silt
7-3	18	0.533	xx	Dark gray silty clay
7-4	nd	0.569	x	Very dark gray/black silty clay
7-5	--		x	Very dark gray/black/brown silty clay

Sample	[PCB] (µg/kg) (dry wt)	Adjusted Dry Dens (g/cc)	Oil/Grease Odor	Soil Characteristics
=====	=====	=====	=====	=====
8-1	100	0.609		Light brown clayey silt / gray clayey silt
8-2	260	0.610		Gray clayey silt
8-3	350	0.610		Dark gray silty clay / OM
8-4	220	0.569	x	Dark gray silty clay
8-5	23	0.606	x	Dark gray/black peaty silty clay
8-6	nd	0.645	xxx	Dark gray silty clay
8-7	--			Very dark gray silty clay/sand/peat
9-1	440	0.296		Very dark brown to black silt & peat
9-2	11	0.354		Gray silty clay
9-3	nd	0.498	xx	Dark gray silty clay/gravel
9-4	--		x	Black peaty silty clay / m/c sand & gravel
10-1	350	0.530		Dark brown silt / gray clayey silt
10-2	440	0.530		Dark gray silty clay
10-3	8.7	0.384	xx	Dark gray silty clay / black peaty silt
10-4	--		xx	Black peaty silt
10-5	--			Gray clayey silt / sand
11-1	54	0.530		Brown/dark gray clayey silt
11-2	110	0.530		M/C sand, F/M gravel / gray clayey silt
11-3	40	0.530	xx	Dark gray silty clay / OM
11-4	22	0.481	xx	Dark gray silty clay / OM
11-5	--		x	Dark gray silty clay
11-6	--			Very dark gray/black silty clay / sand & peat
12-1	310	0.609		Light brown/gray silt/clay
12-2	1000	0.569		Gray silty clay / OM
12-3	610	0.645	xx	Dark gray silty clay / OM
12-4	50	0.533	xx	Dark gray silty clay / OM
12-5	nd	0.569	xx	Dark gray silty clay / OM
12-6	--		xx	Very dark brown peat/wood lam.
13-1	1.8	0.609		Very dark brown/black F/C sand gravel, coal
13-2	330	0.747		Gray silty clay
13-3	7.5	0.400	x	Dark gray silty clay/sand
13-4	--			Dark gray silty clay/peaty sand
14-1	180	0.556		Brown/gray clayey silt
14-2	5.5	0.569		Dark brown/gray topsoil/ OM
14-3	3.7	0.551	xx	Dark gray silty clay / gravel refusal
15-1	150	0.663		Brown/gray clayey silt
15-2	250	0.663		Blue gray clayey silt
15-3	31	0.662	xx	Blue gray clayey silt
15-4	150	0.551	xx	Very dark gray/black silty clay
15-5	nd	0.726	x	Very dark gray/black silty clay
15-6	--			Very dark gray/black silty clay / OM/peat
16-1	330	0.424		Brown/dark gray silt/silty clay
16-2	290	0.369		Gray clayey silt
16-3	110	0.431	xx	Gray clayey silt / dark gray silty clay

Sample	[PCB] (mg/kg) (dry wt)	Adjusted Dry Dens (g/cc)	Oil/Grease Odor	Soil Characteristics
=====	=====	=====	=====	=====
16-4	42	0.464	xx	Dark gray silty clay
16-5	13	0.369		Black silty clay/OM
16-6	--		xx	Gray silty clay
16-7	--		xx	Gray silty clay
16-8	--			Gray silty clay / black silty C sand, gravel
17-1	1.9	1.590		Black coal slag / brown M sand
17-2	140	0.663		Gray clayey silt / OM
17-3	5.1	0.662		Gray brown silty clay
17-4	--			Light brown M/C sand
18-1	19	0.530		Dark brown clayey silt/gray brown silty clay
18-2	1.1	0.530	xx	Gray silty clay
18-3	1.4	0.533	xx	Gray/black silty clay
18-4	--		xx	Black peaty silt / gravel refusal
19-1	33	0.636		Brown silt / OM / gray silt
19-2	62	0.625		Light gray silt
19-3	39	0.551	xx	Gray clayey silt
19-4	40	0.569	xx	Gray clayey silt
19-5	2.4	0.747	xx	Black coarse sand / gray white silty clay
19-6	--			Gray brown silt / OM / gravel / peaty sand
20-1	nd	1.590		Dark brown/black silty sand
20-2	nd	1.590		brown M/C sand
20-3	--			Gray black silty sand
21-1	3.6	0.606		Brown/gray clay & silt
21-2	53	0.625	xxx	Dark gray silty clay
21-3	20	0.533	xxx	Dark gray silty clay
21-4	nd	0.705	xx	Gray silty clay/white layers
21-5	--		xxx	Very dark gray/black silty clay
21-6	--			Black peat/sand/gravel
22-1	61	0.606		Dark gray silt/brown sandy silt/clayey silt
22-2	110	0.533		Light brown/gray silt
22-3	90	0.533	xx	Dark gray silty clay
22-4	210	0.551		Dark gray silty clay
22-5	27	0.705		Black silty clay/sand
22-6	nd	0.587	xxx	Black silty clay
22-7	--		xxx	Black silt/silty clay
22-8	--			Feat
23-1	32	0.551		Topsoil / gray clayey silt
23-2	110	0.705		Gray clayey silt/OM
23-3	120	0.515		Gray/dark gray clayey silt
23-4	nd	0.587	xxx	Dark gray clayey silt
23-5	--		x	Gray/black silty clay
23-6	--			Gray black silty clay/flood laminae
24-1	19	0.636		Gray brown silt
24-2	80	0.636		Dark brown silt

Sample	[PCB] (mg/kg) (dry wt)	Adjusted Dry Dens (g/cc)	Oil/Grease Odor	Soil Characteristics
-----	-----	-----	-----	-----
24-3	nd	0.645	xx	dark gray clayey silt
24-4	--		xx	gray clayey silt
24-5	--			Dark brown silty peat
24-a1	--			Dark brown silt
24-a2	--			Dark brown silt
25-1	41	0.551		Gray clayey silt
25-2	40	0.533		Silt/clay
25-3	36	0.464	xx	Gray clay/silt
25-4	38	0.498		Gray/black clayey silt
25-5			xx	Gray/black clayey silt
25-6	39	0.515		Clayey silt/OM
25-7	43	0.587		White clay laminae
25-8	23	0.268		Peat/sand
26-1	220	0.498		Dark brown silt/light gray silt
26-2	140	0.481		Light gray silt
26-3	94	0.431		Light gray silt/clayey silt
26-4	120	0.533	xx	Light gray clayey silt/silty clay
26-5	nd	0.587	xx	Gray silty clay
26-6	nd	0.481		Dark brown silty clay
26-7	--			Dark brown silty clay / gravel refusal
27-1	62	0.556		Topsoil/black clayey silt
27-2	68	0.551		Gray clayey silt/sand
27-3a	5	0.498	xx	Dark gray silty clay
27-3b	nd	0.498	xx	Dark gray silty clay
27-4	nd	0.515		Dark gray silty clay
27-5	nd	0.836		Black peat
28-1	50	0.533		Dark brown silt/sand/pulp
28-2	10	0.448		Light brown sand/pulp
28-3	nd	1.718	--xx	Dark gray coarse sand/coal
28-4	2.6	0.791		Sand/silty clay laminae
28-5	--		xx	Light gray clay
28-6	--		xx	Very dark gray silty clay
28-7	--		xx	Very dark gray clayey silt
28-8	--			Black silty sand
29-1	69	0.556		Brown peaty silt
29-2	340	0.551		Gray/brown clayey silt/sand
29-3	65	0.481		Gray silt
29-4	nd	0.515	xx	Gray clayey silt
29-5	--		xx	Dark gray silty clay / gravel refusal
30-1	170	0.636		Gray clayey silt/brown silt/sand
30-2	5.4	0.645	xx	Dark gray clayey silt
30-3	nd	0.569	xx	Dark gray clayey silt
30-4	--			Very dark brown peaty silt
31-1	11	0.533		Brown clayey silt/pulp
31-2	8	0.448		Brown silt/pulp/F/M sand

Sample	(PCB) (ng/kg) (dry wt)	Adjusted Dry Dens (g/cc)	Oil/Grease Odor	Soil Characteristics
=====	=====	=====	=====	=====
31-3	13	0.606		Dark gray silty clay/white pulp
31-4	nd	1.064		White clay
31-5	--			White clay
31-6	--		xx	Dark gray silty clay
31-7a	--			Gray clay
31-7b	--			Peat
32-1	59	0.424		Dark brown/gray silt
32-2	130	0.415		Brown sand/silt/pulp
32-3	130	0.431	xx	Gray F/C sand / pulp
32-4	65	0.384	xx	Gray/brown F sand/pulp laminae
32-5	--			White clay/peat/refusal
33-1	22	0.556		Gray brown silt
33-2	nd	0.498	xx	Gray silt/silty clay
33-3	nd	0.551		Gray silty clay/ peat
34-1	210	0.498		Loose peat & clay
34-2	58	0.464		Wet peat & clay
34-3	7.4	0.325	xx	Black peat/OM/gray clay
34-4	6.8	0.384		Dark gray clay/OM
34-5	nd	0.296		Dark gray clay
34-6				Dark gray clay
34-7				Dark gray clay
34-8				Dark gray clay
34-9				Dark gray clay
34-10				Dark gray clay
34-11	nd	0.685		Dark gray clay / peat and sand
35-1	5.2	0.814		Brown silt/ M/C sand
35-2	nd	1.634		Dark gray sand / silt
35-3	nd	1.594	xx	Dark gray sand / silt
35-4	6.5	1.594	xx	Dark gray sand / silt
35-5	--		xx	Dark gray silt
35-6				Dark gray silt
35-7				Dark gray silt
35-8	--			Dark brown peat/ gray sand
36-1	1.2	0.795		Gray/black clayey silt
36-2	nd	0.795		Mottled gray clayey silt
36-3	nd	0.791	xx	Mottled gray clayey silt/ dark gray silt
36-4	nd	1.120	x	Brown/dark gray clayey silt laminae/gravel re
37-1	150	0.481		Gray/dark gray silty clay
37-2	440	0.431	xx	Gray/dark gray silty clay
37-3	470	0.400	xx	Gray/dark gray silty clay
37-4a	--			Light gray/black silty clay
37-4b	nd	0.415		Dark gray silty clay
37-5	nd	0.400		Dark gray silty clay
37-6	--			Dark gray silty clay
38-1	64	0.663		Gray /white/ brown clayey silt

Sample	(PCB) (ng/kg) (dry wt)	Adjusted Dry Dens (g/cc)	Oil/Grease Odor	Soil Characteristics
=====	=====	=====	=====	=====
38-2	200	0.662		Gray clayey silt
38-3	280	0.645		Dark gray silty clay
38-4	9.3	0.369		Black silty peat
38-5a	--		xx	Gray silty clay
38-5b	--			Black silty peat
38-6	--			Black silty peat / gray clay lens
38-7	--			Black peaty silt / sand
39-1	210	0.415		Black silty clay
39-2a	--			Black silty clay
39-2b	6.7	0.645		Dark gray silty clay
39-3	nd	0.498	x	Gray/brown silty clay
39-4	--			Gray/brown silty clay
39-5	--			Sand/peat/gray brown silty clay laminae
39-6	--			Gray brown sand
40-1	49	0.663		Brown/gray silt
40-2	170	0.662	xx	Green/gray clayey silt
40-3	150	0.685	xx	Green/gray clayey silt
40-4	53	0.533		Light gray silty clay
40-5	--			Black peaty silt
40-6	--			Green/gray silty sand/refusal
41-1	nd	0.498		Brown/very dark gray silty sand
41-2				
41-3				
41-4	4.9	1.407	xx	Sand/silt flood laminae
41-5	--			Sand/silt
41-6	--			Dark brown silty peat
42-1	190	0.448		Gray silt
42-2	nd	0.203		Black silty peat
42-3	--			Dark brown silty peat
43-1	3.5	0.583		Brown clayey silt
43-2	230	0.587		Gray/brown clayey silt
43-3	260	0.481		Gray/dark gray clayey silt
43-4	2.1	0.325		Dark gray clayey silt/ black peat
44-1	1.4	1.241		Brown silty sand
44-2	16	1.338	xx	Very dark gray M/C sand / silt
44-3	9.4	1.517	xx	Very dark gray M/C sand / silt
45-1	180	0.551		Brown silty peat/ gray silty clay
45-2	nd	0.384	xx	Dark brown silty peat
45-3	52	0.606		Gray silt
45-4	nd	0.533		Dark gray brown clayey silt/peat
45-5	--			Black silty sand/peat
46-1	8.9	0.339		Gray brown peaty silt
46-2	nd	0.339		Black/dark brown peat to 4 ft/ sand refusal

Sample	[PCB] (ng/kg) (dry wt)	Adjusted Dry Dens (g/cc)	Oil/Grease Odor	Soil Characteristics
=====	=====	=====	=====	=====
47-1	180	0.310		Brown peat / gray peaty silt
47-2	20	0.481		Gray peaty silt
47-3	nd	0.498		Dark gray brown/black silty peat
47-4	--			Black silty peat
48-1	120	0.583		Brown clayey peat/ gray clayey silt
48-2	330	0.569		Gray clayey silt
48-3	54	0.481		Gray clayey silt/OM
48-4	2	0.431	x	Dark gray silty clay
48-5	nd	0.606		Dark gray clayey silt/sand/OM
48-6				
48-7.5	nd	0.255		Very dark brown peat
49-1	41	0.551		Gray/black/dark brown silt
49-2	nd	0.431		Black silty peat
49-3	nd	0.625	xx	Gray silty clay
49-4	--			Light gray F/M sand/peat laminae
49-5	--			Gray M sand
50-1	100	0.530		Orange/brown/gray silt
50-2	nd	0.448	xx	Gray silt
50-3	nd	0.664	xx	Gray silt
50-4	--			Black peaty silt/sand/peat
51-1	13	0.415		Boring Log Not Available
51-2	nd	0.354		
51-3	nd	0.705		
51-4	--			
51-5	--			
52-1	290	0.498		Gray silty clay
52-2	550	0.606		Gray silty clay
52-3	nd	0.551		Gray/black silty clay/OM
52-4	nd	0.415		Gray/black silty clay/OM
52-5	nd	1.092		Very dark brown/black peat
53-1	210	0.448		Gray organic silt
53-2	380	0.431	xx	Gray/black silt laminae
53-3	nd	0.431		Very dark gray/brown OM silt
53-4	--			Very dark gray/brown OM silt
53-5	--			Very dark gray/brown OM silt
53-6	--			Very dark brown peat
54-1	2.5	0.533		Gray/brown clayey silt
54-2	nd	0.400	xx	Dark brown clayey silt
54-3	nd	0.448	x	Gray clayey silt
54-4	--			Gray clayey silt
54-5	--			Very dark gray/brown clayey silt
54-6	--			Gray M sand/ pebbles
54-7	--			
55-1	7.9	0.515	xx	Dark gray/brown silt/gray clayey silt

Sample	[PCB] (ng/kg) (dry wt)	Adjusted Dry Dens (g/cc)	Oil/Grease Odor	Soil Characteristics
=====	=====	=====	=====	=====
55-2	nd	0.587	xx	Dark gray clayey silt
55-3	nd	0.481	x	Dark brown clayey silt/DH
55-5				Gray/brown silty F/C sand
55-6	--			Very dark brown peat
56-1	nd	0.791		Very dark brown silt/gray silt
56-2	nd	0.791		Gray silt
56-3	nd	0.685	xx	Gray silt
56-4	--			F/C sand / peat flood laminae
56-5	--			F/C sand / peat flood laminae
57-1	3.6	0.296		Black silty peat
57-2	2	0.448	xx	Dark gray clayey silt
57-3	nd	0.587	xx	Gray brown silty clay
57-4	--			Gray brown silty clay
57-5	--			Gray brown clayey silt/sand/gravel/peat
58-1	370	0.663		Gray silt
58-2	290	0.663		Gray silt
58-3	25	0.662		Gray F/C sand / pebbles
59-1	150	0.530		Red brown silt/ gray silt
59-2	18	0.431		Black F sand/silt/peat
59-3	nd	0.587		Gray F/M sand/silt laminae
60-1	260	0.530		Brown silty clay/ blue gray clayey silt
60-2	nd	0.325	xx	Blue gray silty clay/black peat
60-3	nd	0.515		Gray brown F/M sand / peat / gray clay
60-4	nd	0.705		Light gray brown sand / black peat
60-5	nd	0.415		Very dark brown/black peat
61-1	2.6	0.663		Dark brown silt/ gray brown silty sand
61-2	3.3	1.338		Coarse sand/ refusal
62-1	1.3	0.530		Brown silt/dark gray silt
62-2	nd	0.400	x	Gray silt
62-3	nd	0.769	x	Dark gray clayey silt/coarse sand/refusal
63-1	140	0.663		Gray/brown silt
63-2	5.8	0.663		Gray brown silt
63-3	nd	0.685		Dark gray brown silt/sand/gravel refusal
Total		148.356		
Number		247.000		
Average		0.601		

KEY TO ABBREVIATIONS

snr - sample not recovered
-- - sample collected but not analyzed
nd - not detected
OM - organic material
F/M/C - fine/medium/coarse
x - slight oil odor
xx - oil odor
xxx - strong oil odor